To: Barnes-Weaver, Erin[Barnes-Weaver.Erin@epa.gov]
Cc: Gilbride, Patrick[Gilbride.Patrick@epa.gov]; Holthaus, Randy[Holthaus.Randy@epa.gov]; Stolz, Luke[Stolz.Luke@epa.gov]; Curley, Ganesa[Curley.Ganesa@epa.gov]; Kohler, James[Kohler.James@epa.gov]; Suter, Glenn[suter.glenn@epa.gov]; Parkin, Richard[Parkin.Richard@epa.gov]; Hough, Palmer[Hough.Palmer@epa.gov]; Schofield, Kate[Schofield.Kate@epa.gov]
From: Frithsen, Jeff
Sent: Wed 10/22/2014 1:34:35 PM
Subject: RE: Responses to Request from September 25, 2014 - Part F

Erin:

Below are responses to the questions presented in Part F of your request. Please let me know should you have questions concerning these, or any of our responses to your requests. And please do not hesitate should you need additional information.

Jeff

1. On the tailings dam failure analysis, was there a discussion of whether the dam designs should be constructed to hazard class I versus II (high versus significant) standards?

We discuss hazard classes (categories) on p. 9-9 of the assessment, where we state that the tailings dam would be classified as either Hazard Class I or II. The tailings dam failure probabilities used in the assessment are based on failure probabilities for both hazard classes, with Class II failure probabilities used to estimate an upper bound (i.e., higher probability of failure) and Class I failure probabilities used to estimate a lower bound (i.e., lower probability of failure).

2. Regarding tailings storage expansion that is discussed in Chapter 4, has there been any discussion on whether expansion of Pebble TSFs would be done via upstream construction (versus downstream or centerline). Given the size of the Pebble deposit, it would seem upstream expansion of the TSF would be more likely.

We discuss tailings dam construction methods on p. 4-16 and 4-17 (general discussion) and p. 6-11 (specific scenarios) of the assessment. The dam construction methods put forth in the assessment are based on specifications provided in Ghaffari et al. (2011), which stated that the dam would be raised using downstream construction methods, eventually transitioning to

centerline construction methods. As discussed on p. 4-17, upstream construction may be unsuitable given stability and size concerns.

3. In Chapter four (page 18) there is a discussion of the types of liners for TSFs that could be used, their life span, etc. Was there any discussion or do you know whether liners are expected to be installed, or the feasibility of doing so for such a large TSF like Pebble?

The TSF characteristics put forth in the assessment are based on specifications provided in Ghaffari et al. (2011), which stated that the face of the tailings dam would be lined but did not state that the rest of the TSF would be lined. Given the extremely large size of the TSF, and thus the surface area which would need to be lined, it seems reasonable to assume that lining the entire TSF would pose a significant challenge. Also, as discussed on p. 4-18 and 4-19, any liner used would have a finite lifespan.

4. Did you conduct any further analysis beyond Box 4-7 in Chapter 4 (Page 19) on the feasibility and tradeoffs of using dry stacking techniques, which could greatly impact the failure analysis and other aspect of the assessment?

The tailings disposal methods evaluated in the assessment are based on specifications provided in Ghaffari et al. (2011), which assumed tailings storage impoundments. Although we recognize that disposal via dry stacking would alter risks (p. 4-19 and Box 4-7), the purpose of the assessment was to evaluate the specific designs put forth in Ghaffari et al. (2011), rather than evaluate all possible mine designs.

5. In Chapter 9, there is a discussion of which seismic return period to use for design, but has there been any discussion of what factors of safety would or should be used under seismic loading conditions? It was noted that the minimum FOS for steady state loading conditions is 1.5.

Although we discuss seismic activity in the Bristol Bay region (Section 3.6) and the need to account for seismic activity in mine design (Box 9-2), seismicity was not explicitly incorporated into our dam failure probability estimates. The dam failure probabilities used in the assessment served as conservative estimates, because they were based only on one type of failure (slope failure).

Jeff Frithsen

USEPA-ORD-NCEA

703-347-8623 (office phone)

From: Barnes-Weaver, Erin
Sent: Thursday, September 25, 2014 9:56 AM
To: Frithsen, Jeff; Suter, Glenn
Cc: Gilbride, Patrick; Holthaus, Randy; Stolz, Luke; Curley, Ganesa; Kohler, James
Subject: follow-up from yesterday's discussion

Jeff and Glenn –

Thanks again for taking the time to meet with our team yesterday afternoon. We found the discussion quite helpful and appreciate you meeting with us, particularly so late in the work day.

As we discussed, **please provide us with the following by October 17**, if possible:

(b)(5) Deliberative Process Privilege

(b)(5) Deliberative Process Privilege

(b)(5) Deliberative Process Privilege

Please let us know if you'll need additional time to address this request. Otherwise, we sincerely appreciate your continued assistance and information.

Glenn, all the best on your vacation!

-Erin

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